Northern Everglades and Estuaries Protection Program Update

WRAC Lake Okeechobee Committee Meeting- 09/30/09

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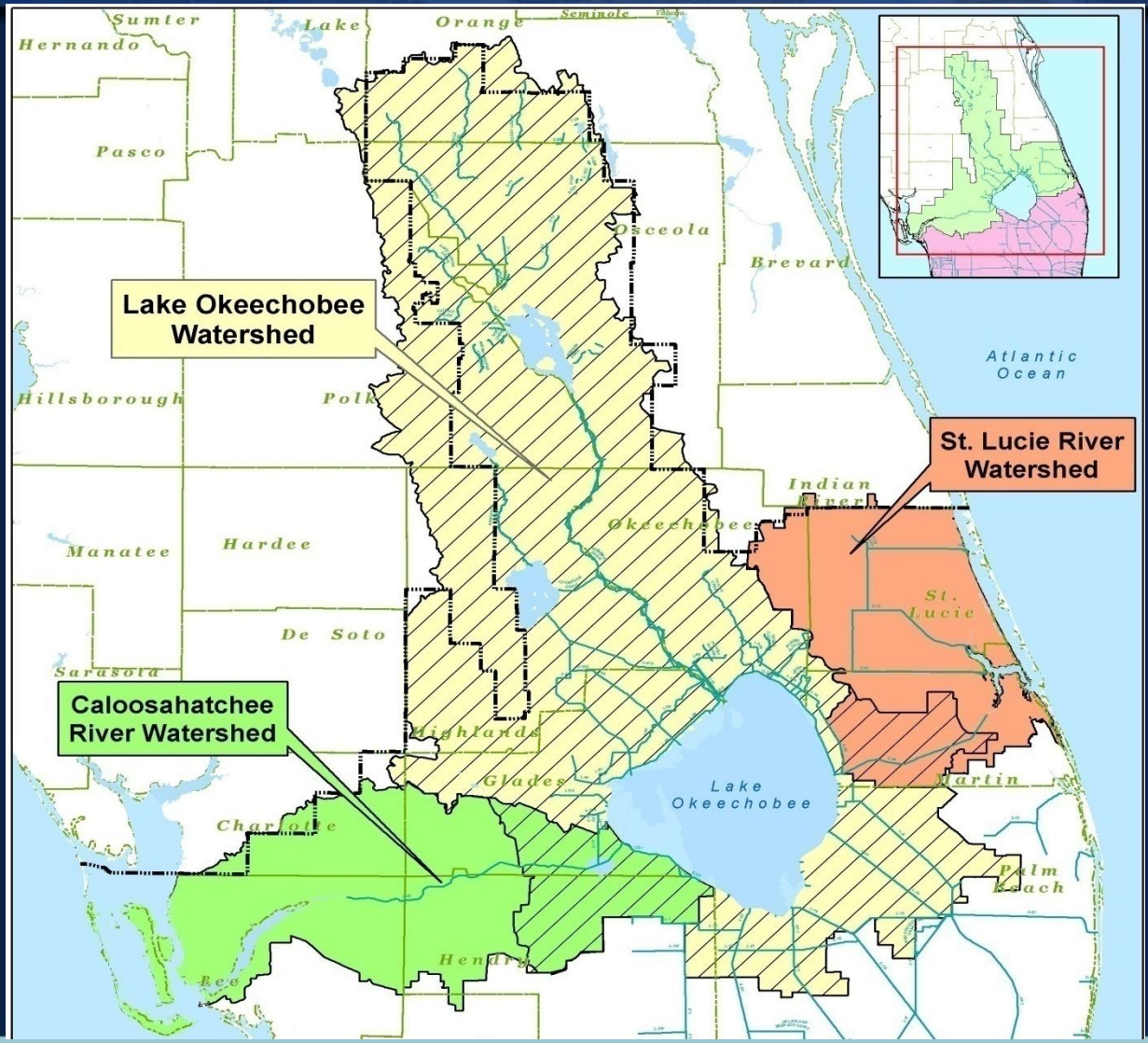
The Northern Everglades



Lake Okeechobee Protection Plan Update

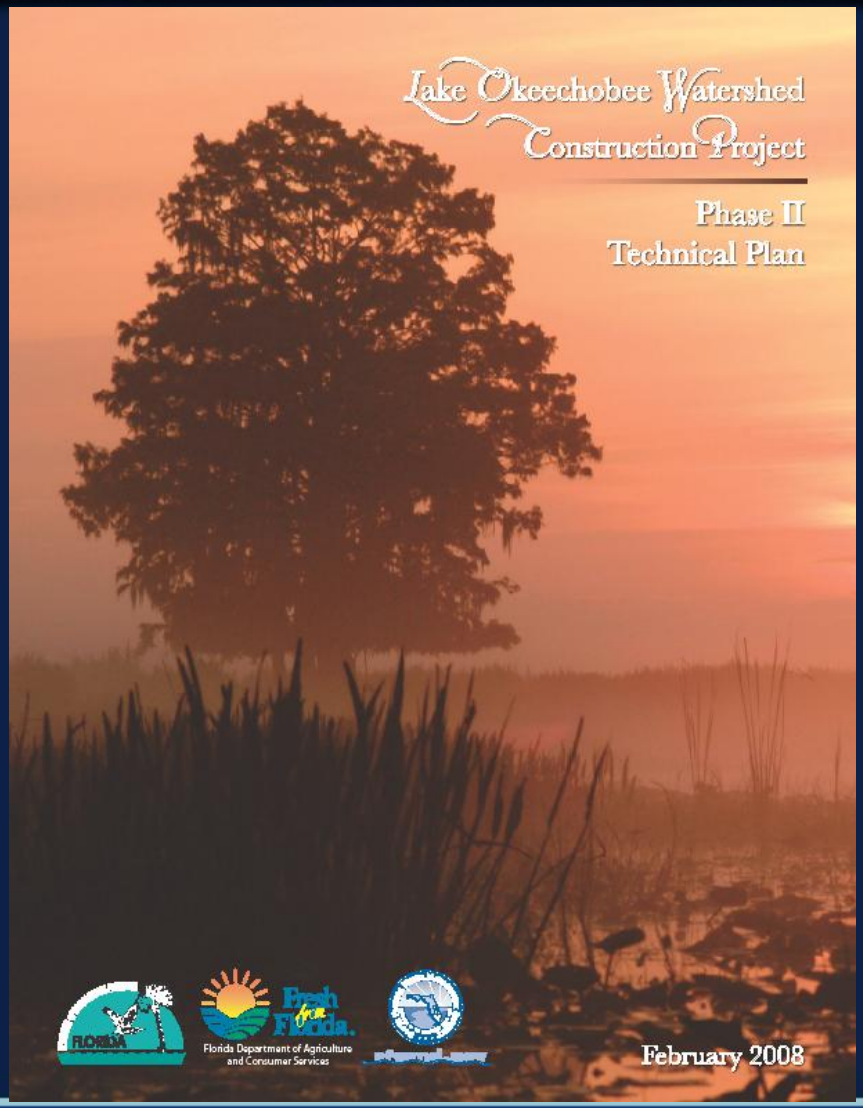
I. Pollutant Control Program

II. Construction Project

III. Research and Water Quality Monitoring Program

Lake Okeechobee Phase II Technical Plan

- Delivered to Legislature on February 1, 2008
- No action was taken during session- therefore plan is deemed approved and may be implemented
- Plan implementation (Process Development & Engineering) is moving forward
- Three- year Plan update due in early 2011



Pollutant Control Program

- Implementation of agricultural and urban BMPs
- Revisions to regulatory programs
  - Environmental Resource Permit (ERP) Program
    - Statewide Stormwater Rule- Water Quality (FDEP)
    - Northern Everglades ERP Basin Rule- Water Quantity (SFWMD)
  - District's Source Control Program Regulatory Rule (Chapter 40E-61)
    - Works of the District Regulatory Phosphorus Source Control Program

Pollutant Control Program

SFWMD Phosphorus Control Program

Construction Project
Lake Side Ranch STA

- Project is designed in two phases:
  - *Phase 1:* STA- North, S-650 pump station and canal improvements
  - *Phase 2:* STA-South and S-191A pump station
- Phase I construction is underway
- Phase II design is underway; construction is contingent on additional funding

Construction Project
Fisheating Creek Feasibility Study

- Fisheating Creek- selected due to challenges associated with this portion of the Lake Okeechobee watershed
- Objective:
  - Improve hydrology and water quality through storage and treatment features
- Feasibility Study has two-phases:
  - Phase I: Included investigation of available information and work plan development- completed in March 2009

Construction Project
Fisheating Creek Feasibility Study (Con't)

- Phase II: Includes alternative formulation, evaluation and selection; compilation of results and write-up of the report- kicked off in May 2009
- Current activities:
  - Refinement of Phase II Technical Plan targets for storage and water quality
  - Modeling:
    - Refining WAM simulations for pre-drainage and existing
  - Outreach program development
    - Greater landowner participation

Construction Project
Chemical Treatment Study

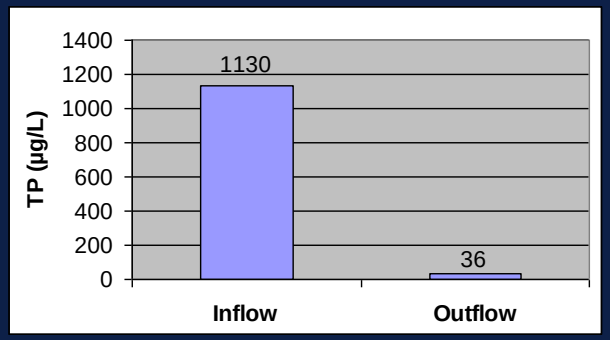
- Designed to investigate available information on chemical treatment technologies that have been tested to reduce TP loads in stormwater runoff and identify technologies appropriate for use in the Northern Everglades
- Phase I: Literature review was completed in July 2009
  - Summarizes latest information on chemical treatment methods and potential Northern Everglades applications
- Phase II: Site identification and potential implementation

Construction Project
Hybrid Wetland Treatment Technology

- Original four sites (Nubbin Slough, Mosquito Creek, Larson 8, and Ideal Grove) continue operation and optimization activities while providing phosphorus concentration reductions ranging from 60 – 90%.
- Cost effectiveness and P load reduction information will be provided in the Year 2 final report due in November.
- FY09 sites constructed at Lemkin Creek (Wolff Ditch and FDOT Ditch) are substantially complete and treating base flows of 4 cfs.
- FY10 funding will be used for continued operation of the existing 6 sites and construction of up to 2 new sites.

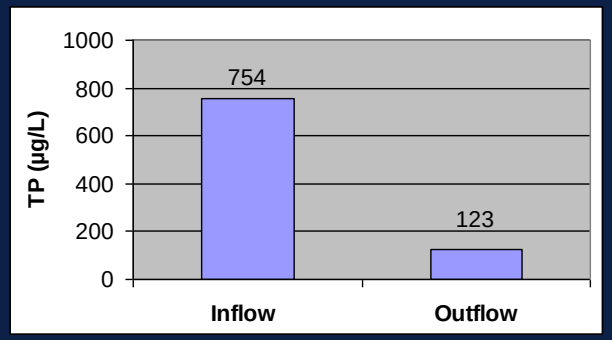
Construction Project
Hybrid Wetland Treatment Technology (Con't)

Mosquito Creek



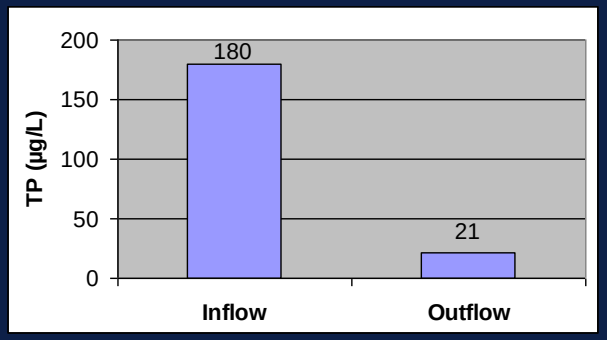
Mean P removal performance, Feb – July 2008

Nubbin Slough



Mean P removal performance, Feb – July 2008

Ideal 2 Grove



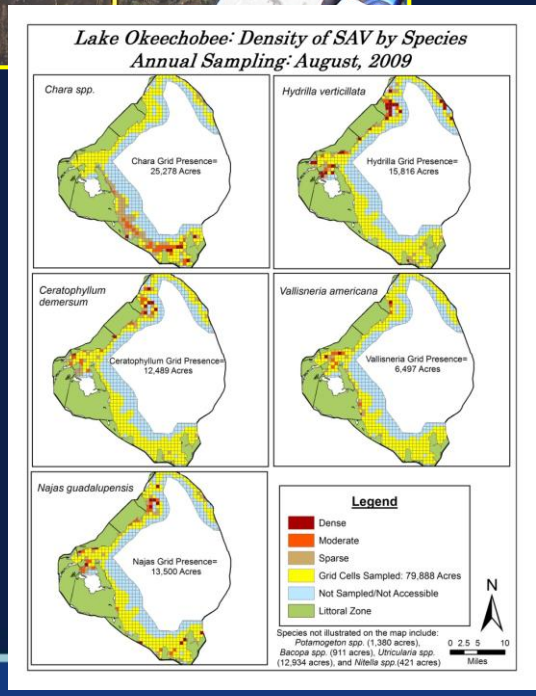
Mean P removal performance, March – July 2008

Dispersed Storage and Treatment

- Originated as Lake Okeechobee and Estuary Recovery Initiative in 2005
  - Included as management measures in LO Phase II Technical Plan and River Watershed Protection Plans
- Primary goals: water retention, load reduction and/or hydrologic restoration
- Dispersed Storage and Treatment Program development is underway
  - Address outstanding items (technical, legal, permitting, etc.)
  - Establish process for solicitation, evaluation and selection of projects

Research and Water Quality Monitoring Projects

- Lake Okeechobee in-Lake Assessment Projects
  - Submerged Aquatic Vegetation
  - Algal Bloom and Toxin
  - Routine Plankton Monitoring
  - Periphyton Research
  - Native Plant Re-vegetation
  - Ecological Data Management System



Research and Water Quality Monitoring Projects

- Sub-basin Monitoring Network (USGS)
- Exotics and Nuisance Species Control
- LO Water Quality Model
- LO Environment Model

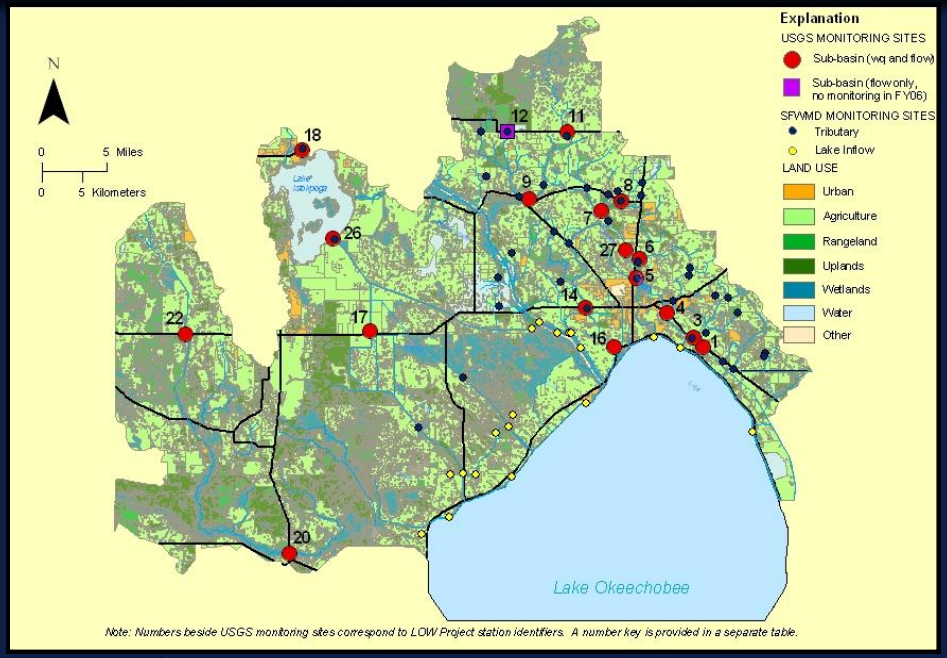
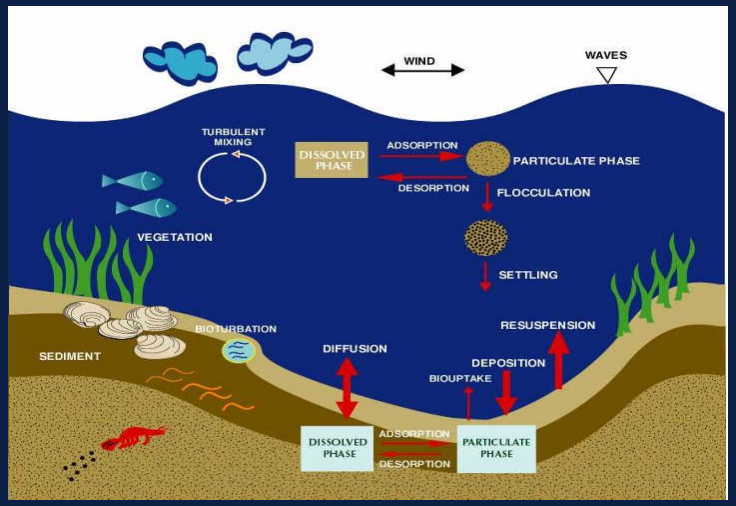


Figure 1. USGS sub-basin monitoring stations in the Lake Okeechobee watershed.



Caloosahatchee and St. Lucie River Watershed Protection Plans Update

I. Pollutant Control Program

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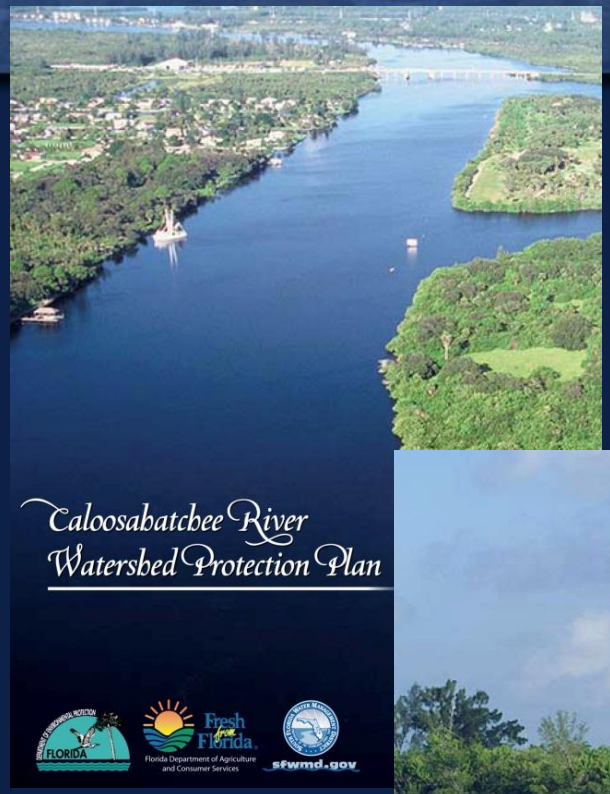
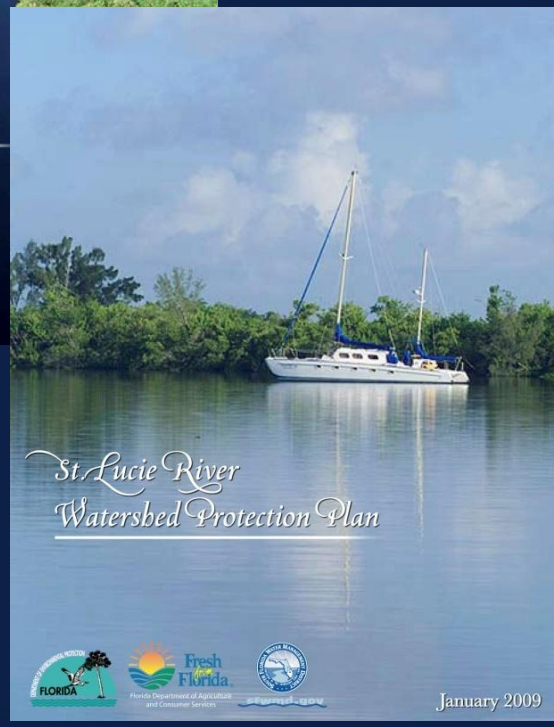
River Watershed Protection Plans

- Final Plans submitted to the Legislature on Jan 1, 2009
- Legislature took no action on the plans during the 2009 legislative session, hence the plans are deemed approved and may be implemented
- RWPPs will provide the basis for FDEP's BMAP development





Pollutant Control Program

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- Revisions to regulatory programs
  - Environmental Resource Permit (ERP) Program
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- District's Source Control Program Regulatory Rule (Chapter 40E-61)
    - Establishment of River Watershed Nutrient Source Control Programs

Pollutant Control Program

- Nutrient Source Control Programs- include following phases:
  - Water quality monitoring
  - Data management and assessment
  - BMP effectiveness performance measure development
  - Rule making and adoption
  - Rule implementation
- The first four phases are expected to be completed by the end of FY2012, followed by rule implementation
  - Multiple tasks requiring staff resources as well as funding in future fiscal years in order to progress into the implementation phase

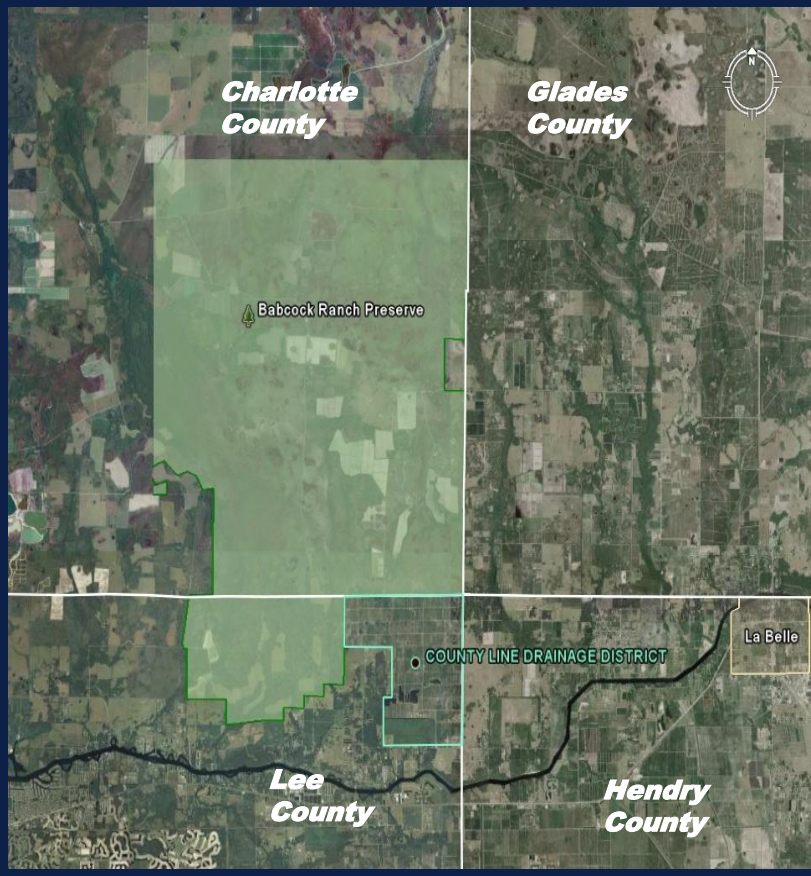
Construction Project

C-43 Water Quality Treatment and Testing Facility

- Objective: Develop, design and build a testing facility to provide total nitrogen treatment
- Several major tasks completed:
  - Cultural resources assessment survey; Phase I/II Environmental site assessments; Total nitrogen reduction technologies review; Topographic survey
- Others underway:
  - C- 43 water quality project plan development and design
- Next Step: Complete design of test cells

Construction Project
Spanish Creek/Four Corners

- The Spanish Creek Four Corners Project is a management measure of the Caloosahatchee River Watershed Protection Plan.
- The overall goal of this multi-phase restoration project is to provide flow-way restoration, water quality improvement, and aquifer recharge.
- Implementation of the larger restoration project is based on future funding opportunities.



County Line Ditch/Four Corners Phase I

CANAL CLEANING BY HENDRY COUNTY

TORTOISE RELOCATION

Construction Project
County Line Ditch/Four Corners Phase I

- Completed several major tasks under Phase I:
  - Installation of monitoring wells and staff gages
  - County Line Ditch Clearance south of CR-78 and associated gopher tortoise relocation
  - Topographic surveys to obtain cross sections of County Line ditch and associated infrastructure
- On- going efforts:
  - Gathering data from monitoring wells
- Next Steps:
  - Modeling of alternatives with the new survey data
    - Compare alternatives to improve the capacity of CLD to meet appropriate drainage goals
  - Future phases dependant on Legislature funding

Construction Project
Powell Creek Algal Turf Scrubber

- Pilot construction completed and operation began in October 08
- Data collection underway
  - Pilot unit is growing algae and generally working as expected
- Next steps- Completion of monitoring and final report by January 2010

Construction Project
5/5/5 projects with Martin County

- **Manatee Pocket Dredging:** Removal of accumulated muck for water quality and habitat improvement
  - Permits obtained; Gopher tortoise relocation completed
  - Contractor is secured for construction; Mobilization is expected to start in fall 2009.
- **Manatee Creek Basin Water Quality Retrofit:** Provides treatment of uncontrolled discharges to the Manatee Pocket from the Manatee Creek
  - Survey and redesign is complete.
  - Permits mostly completed.
  - Phase II land acquisition complete; Phase III project layout configured and all essential parcels obtained

Construction Project
5/5/5 projects with Martin County (Con't)

- **North River Shores Vacuum Sewer System-** Enhances water quality in the North Fork of the St. Lucie River by eliminating nutrient loading from septic systems
  - Permits and construction plans are complete
  - Project bid pricing request is sent out to vendors
  - Martin County staff plans on taking a final Assessment Resolution to the BOCC in October and construction will start shortly after.
- **Old Palm City Phase III Water Quality Retrofit-** Improves water quality through developing a neighborhood stormwater quality management system
  - Land acquisition was completed in April 2009 with the closing on the final three lots.
  - Acquisition of an additional two lots to increase the storage capacity of the project is currently under way.

C-44 Project

- Design completed; Land acquired
- USACE intends to construct C-44 Project in multiple contracts
  - Break apart existing plans and convert specifications to USACE format
- Contract 1
  - Construct Intake and C-132/C-133/C-133A Canals, Citrus Boulevard improvements, Bar B Ranch access, and Troup Indiantown Water Control District features
  - Construction start scheduled for September 2010 and last 2 years.
- Two additional contracts for Reservoir/Pump Station and STAs
  - All construction complete 2017

Research and WQ Monitoring Program
Research Projects

Research Topics	Project	CRE	SLE
Nutrient Budget	Measurements of Primary Production in CRE and SLE (Contract)	√	√
	Groundwater Seepage Studies in SLE and CRE (Contracts) *	√	√
Dissolved Oxygen Dynamics	SLE DO Data Analyses (In-House)		√
	CRE DO Data Collection (In-House)	√	
Low Salinity Zone	CRE Oligohaline Zone Study (Contract)	√	
Light Attenuation in San Carlos Bay	CRE Measurements of Colored Organic Matter (In-House)	√	
Integrated Modeling	SLE Water Quality Model update (In-House)		√
	SLE Opti6 Model Reconfiguration (In-House)		√

Research and WQ Monitoring Program

Synoptic Flow and WQ Monitoring- CRW

- Objectives:
  - Estimate the flow contribution from the tributaries, east of S-79, to the Caloosahatchee River's main stem, and, to validate the location of proposed long-term monitoring sites under CRWPP
  - Support source control program development for the freshwater portion of the watershed
- Wet season (May–September 2009) water quality and flow data collection
- Bi-weekly measurements at 16 sites

Research and WQ Monitoring Program

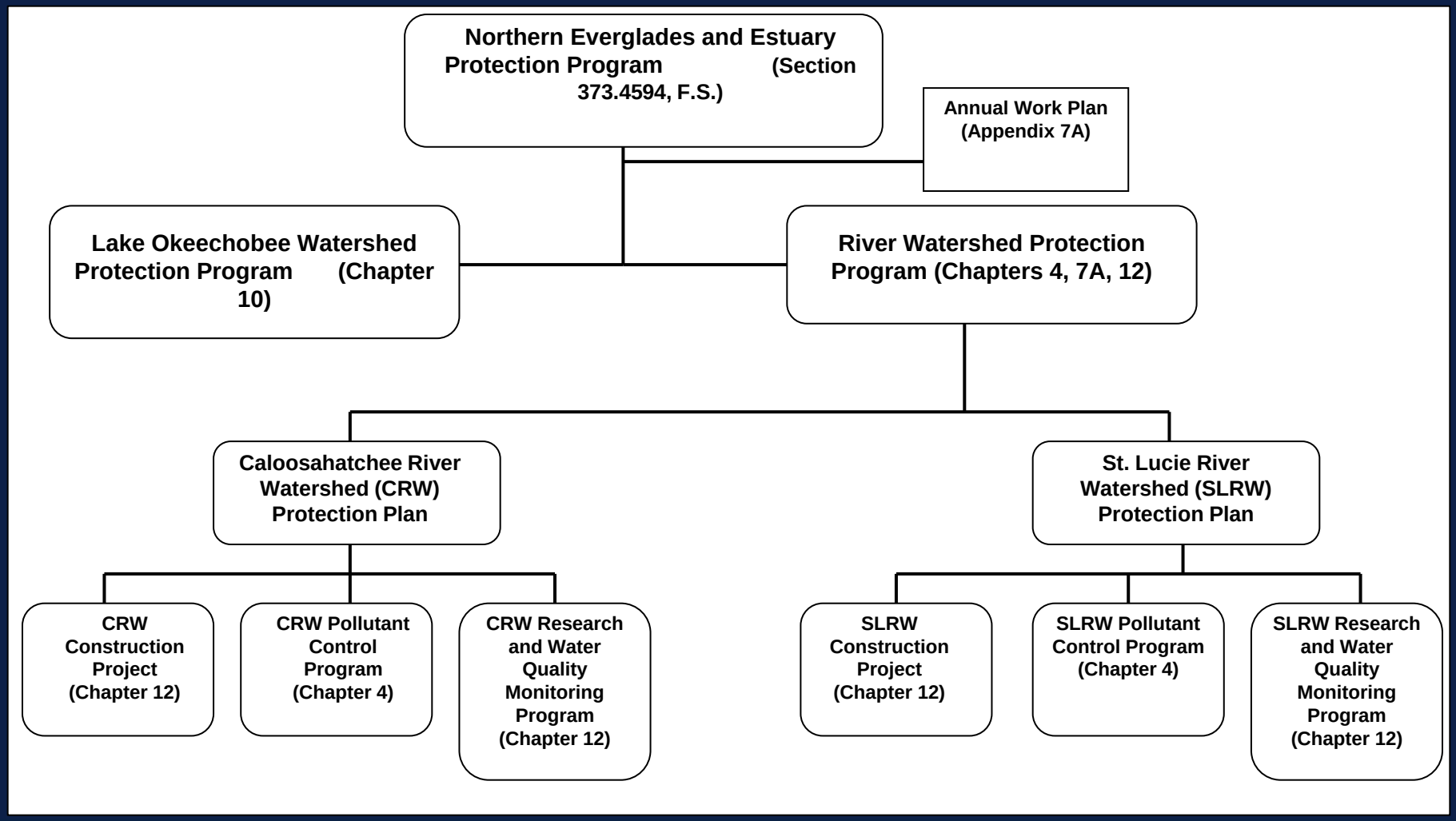
Synoptic Flow and WQ Monitoring- CRW

- Flow Measurements conducted using the ADCP
  - Acoustic Doppler Current Profiler mounted on an un-manned tri-maran boat hull (Riverboat)
- The Marsh-McBirney meter was used in shallow and very low-flowing channels
- Water Quality- Grab samples

Annual Reporting

- South Florida Environmental Report (SFER)
  - Status Updates of Projects
    - Included in several chapters in SFER
      - Lake Okeechobee Watershed (Chapter 10)
      - Caloosahatchee and St. Lucie River Watersheds (Chapter 12)
      - NE Source Control Program (Chapter 4)
  - Northern Everglades Annual Work Plan for FY2010 (Appendix 7A)
    - Includes projects undertaken by coordinating agencies

Annual Reporting- SFER



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Questions